

USSR

PEREGUD, Ye. A. and GERNET, Ye. V., Khimiya, 1970, pp 2, 3-8, 9-12, 13-15

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1/2 030

UNCLASSIFIED

PROCESSING DATE--23OCT70

TITLE--MECHANISMS OF A VOLITIONAL EFFORT -U-

AUTHOR--GERON, YE.

COUNTRY OF INFO--USSR

SOURCE--VOPROSY PSIKHOLOGII, 1970, NR 3, PP 62-76

DATE PUBLISHED-----70

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TOPIC TAGS--PSYCHOPHYSIOLOGY, ELECTROENCEPHALOGRAPHY, VERBAL BEHAVIOR

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRA--3001/0802

STEP NO--UR/0402/70/000/003/0062/0075

CIRC ACCESSION NO--AP0126486

UNCLASSIFIED

2/2 030

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0126486

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CONDUCTED EXPERIMENTS SHOW THAT MAN'S VOLITIONAL EFFORTS ARE BROUGHT ABOUT BY DIFFERENT PSYCHOPHYSIOLOGICAL MECHANISMS DEPENDING ON THE TREND OF THE EFFORT BEING MADE. ONE SHOULD DIFFERENTIATE BETWEEN 1) THE EFFORTS INVOLVED IN THE ORGANIZATION AND THE LEARNING OF MOVEMENTS AND 2) THE EFFORTS DIRECTED AT THE PERFORMANCE OF MOVEMENTS THEMSELVES. IN THE FIRST CASE SOME ISOMORPHOUSNESS IS OBSERVED OF PSYCHOPHYSIOLOGICAL REACTIONS (GSR AND EEG SLOW RHYTHMS) WITH THE RATE AND THE RHYTHM OF MOVEMENTS BEING LEARNED. IN THE SECOND CASE THE ACTIVATION OF ADDITIONAL SYSTEMS UNDER THE INFLUENCE OF SET REACTIONS DIRECTED AT OVERCOMING ARISING DIFFICULTIES IS OBSERVED. IN ALL CASES, ACCORDING TO EMG DATA, HOWEVER, VERBAL SET REACTIONS PLAY A DECISIVE ROLE. FACILITY: VYSSHIY INSTITUT FIZICHESKOY KUL'TURY, SOFIYA.

UNCLASSIFIED



2/2 022

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0136487

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE PROBABILITY WAS DETD. OF THE SPONTANEOUS SINGLE PHOTON TRANSITION FROM THE METASTABLE LEVEL 2S SUBONE HALF OF THE H ATOM WITH AN ACCOUNT OF THE SPIN STATES. THE BREIT TELLER FORMULA WHICH DESCRIBES THE ANALOGOUS PROCESS WAS CORRECTED. THE PROBABILITY WAS ALSO CALCD. OF THE STIMULATED TRANSITION FROM THE SAME LEVEL.

UNCLASSIFIED

UDC 681.327

USSR

GERSAMIYA, A. T., Computer Center, Academy of Sciences Georgian SSR

"Pneumatic Punched Card Feed"

USSR Author's Certificate No 336674, Cl. G 06k 13/02, filed 7 Oct 70, published 21 Apr 72 (from Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 14, 21 Apr 72, p 167)

Abstract: The device contains a magazine with a card deck and, connected to it, a vacuum card separating device and a transport mechanism containing a system of rollers and a feed eccentric. To increase the operating speed of the device and make it more reliable, the card separating device contains a valve which is mechanically coupled with the feed eccentric of the transport mechanism.

1/1

Pesticides

USSR

UDC 632.954:630:576.8

KRUGLOV, Yu. V., GERSH, N. B., and BEI-BIYENKO, N. V., All Union Scientific Research Institute of Agricultural Microbiology

"The Effect of Meturin on the Biological Activity of Soil"

Moscow, Khimiya v Sel'skom Khozyaistve, No 4, 1973, pp 54-56

Abstract: It has been shown that meturin -- N-phenyl-N-hydroxy-N-methylurea -- has essentially no effect on soil microorganisms nitrification process or enzyme activity. The only significant change in the soil was found in the activity of aerobic cellulose decomposing bacteria and urease. The lowering of some indicators of biological activity in the soil treated with meturin is due to a lower weed content of a given field, so that organic materials are not introduced into the soil with the weeds.

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Acc. Nr:

AT0043977

Ref. Code: UR0000

PRIMARY SOURCE: Geofizicheskiy Sbornik, Kiev, 1970, Nr 33,  
pp 61-63

CONNECTION BETWEEN VERTICAL MOTIONS AND ANOMALIES  
OF GRAVITY IN THE TERRITORY OF THE UKRAINIAN SHIELD

V. A. Gershanok

(The A. M. Gorky State University, Perm)

Summary

The connection is considered between present-day vertical motions and the smoothed Bouguer anomalies which were computed according to isodynamic curves for the Ukrainian crystalline shield. It is shown that the Bouguer anomalies rise with the diminishing of the rising velocity. This statement bases on the fact that there is some likeness between the reasons that cause both phenomena. We can consider them to be dependent on the processes proceeding in the upper mantle.

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USSR

UDC 621.382.602

LOZOVSKIY, V. N., NIKOLAYEVA, Ye. A., POPOV, V. P., UDYANSKAYA, A. I.,  
GERSHANOV, V. Yu.

"Concerning the Dimensions and Configuration of Electrically Heterogeneous Structures Obtained by the Zone Melting Method With a Temperature Gradient"

V sb. Vopr. mikroelektroniki (Problems of Microelectronics -- Collection of Works), Kiev, "Nauk. dumka," 1971, pp 163-167 (from RZh--Elektronika i yeye primeneniya, No 10, October 1971, Abstract No 108429)

Translation: The geometrical characteristics are considered of electrically heterogeneous structures obtained in Si by the zone melting method with a temperature gradient as a function of the dimensions and form of the liquid zone, and also the form of its path. It is shown that zone melting with a temperature gradient makes it possible to form microstructures with diversified dimensions and form: multilayer, perpendicular surfaces of rectangular form; grid structures; cylindrical channels; and others. Using metal sputtering and subsequent photolithography, it is possible to obtain structures of practically any configuration. 1 ill. 5 ref. 1.M.

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USSR

UDC 536.421.4+536.421.1

LOZOVSKIY, V. N., GERSHANOV, V. Yu., KALINYUK, A. I., NIKOLAYEVA, Ye. A.,  
POPOV, V. P., and UDYANSKAYA, A. I.

"Basic Laws of Silicon Crystallization for a Zone Melt With a Temperature Gradient"

V sb. Kristallizatsiya i faz. prevrashcheniya (Crystallization and Phase Transformations -- collection of works), Minsk, "Nauka i tekhn." 1971, pp 91-97 (from RZh-Fizika, No 9, 1971, Abstract No 9E382)

Translation: The kinetics of a zone melt with a temperature gradient are experimentally investigated in Si-Al, Si-Ag, Si-Au, Si-Fe, Si-Cu, Si-Ni, Si-Sn, Si-Pt systems. Curves expressing the dependence of the liquid zone migration rate on its thickness and temperature are obtained for these systems, the values of the activation energy of zone movement are found, and the effect of the third component on the zone velocity is determined; it is established that, in the region of fine zones and small temperature gradients, the stability of the zone movement is independent of the anisotropy of the solution and the crystallization; in the opposite case the morphology of the zone is determined by slowly dissolving planes of the (111) type. Author's abstract  
1/1

USSR

UDC 621.382.602

LOMOVSAIY, V.N., NIKOLAYOVA, YE.A., ODEKHERAKH, A.I., VEREINIGOV, V.M.

"Forming Of Electrically Heterogeneous Microstructure In Crystals By The Zone Melting Method With A Temperature Gradient"

V sb. Vopr. mikroelektroniki (Problems Of Microelectronics--Collection Of Works), Kiev, "Nauk.dumka," 1971, pp 167-172 (from RZh--Elektronika i yeye primeneniya, No 10, October 1971, Abstract No 102428)

Translation: In the volume of low-resistance Si, microregions are produced with resistivities equal to  $(1-2) \cdot 10^2$  ohm.cm; p-n junctions are easily obtained with the aid of linear aluminum zones in n-Si, and zones of complex composition make it possible to introduce certain impurities into the crystal; zone melting with a temperature gradient makes it possible to create p-n junctions with an inverse impurity gradient, and others.

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1/2 009 UNCLASSIFIED PROCESSING DATE--02OCT70  
TITLE--STUDIES OF BOTTOM RELIEF AND SEDIMENTS OF THE SOUTHWESTERN APICAL  
SHELF -U-  
AUTHOR--(02)-AVILOV, I.K., GERSHANOVICH, D.E.  
COUNTRY OF INFO--USSR  
SOURCE--OKEANOLOGIYA, 1970, VOL 10, NR 2, PP 301-306  
DATE PUBLISHED-----70  
SUBJECT AREAS--MECH., IND., CIVIL AND MARINE ENGR, EARTH SCIENCES AND  
OCEANOGRAPHY, BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--MARINE GEOLOGY, PHYTOPLANKTON, OCEAN BOTTOM TOPOGRAPHY, BOTTOM  
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2/2 009

UNCLASSIFIED

PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0109452

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE RESULTS OF THE MARINE GEOLOGICAL STUDIES ON A VNIRO CRUISE OF THE R, V AKADEMIK KNIPOVICH ARE BEING CONSIDERED. A NARROW SHELF SOUTH OF THE CONGO RIVER MOUTH IS CHARACTERIZED BY DIFFERENT SEDIMENT COMPOSITION IN ITS DIFFERENT PARTS. TERRIGENOUS SEDIMENTS WERE FOUND TO BE REPLACED BY CARBONATE SEDIMENTS IN THE VICINITY OF THE CUNENE RIVER MOUTH. HIGH CONCENTRATIONS OF SOME MOST IMPORTANT SEDIMENT COMPONENTS ARE CAUSED BY PECULIAR SEDIMENT FORMING FACTORS. SAMPLINGS IN THE ZONES OF THE INTENSIVE DEVELOPMENT OF DIATOM PHYTOPLANKTON AND ITS MASS DEATH WITHIN THE SHELF AREA NEAR THE WALFISH BAY REVEALED SEDIMENTS WITH ABNORMALLY HIGH CONTENT OF ORGANIC MATTER (FROM 15 TO 23PERCENT) PREVIOUSLY NOT FOUND ANYWHERE IN THE OPEN SHELF AREAS. IN THE LUDERITZ AREA, TERRIGENOUS MUDDY SAND BEYOND THE SHELF ZONE CONTAINS TO 8.4PERCENT ELEMENTARY PHOSPHORUS, THIS VALUE BEING MUCH IN EXCESS OF THE PHOSPHORUS CONTENT OF THE KNOWN CARBONATE PHOSPHORITE PLATFORMS OF THE AGULHAS BANK AND FORMING APPROXIMATELY TWO-THIRDS OF THE AMOUNT OF PHOSPHORUS BOUND INTO PHOSPHORITE NODULES. AT THE OUTER EDGE OF THE SHELF NORTH OF THE CONGO RIVER MOUTH AND NEAR LUDERITZ, SEDIMENTS CONTAIN AN UNUSUALLY HIGH AMOUNT OF IRON (16.5 AND 9.9PERCENT RESPECTIVELY) AT A RELATIVELY SMALL CONCENTRATION OF PELITE PARTICLES (23 AND 6.5PERCENT). THE HIGH IRON CONCENTRATIONS CAN APPARENTLY BE RELATED TO GLAUCONITE (MORE THAN 80PERCENT AND APPROXIMATELY 40PERCENT). FACILITY: VSESOYUZYNY N-I INSTITUT MORSKOGO RYBNOGO KHOZYAYSTVA I OKEANOGRAFII.

UNCLASSIFIED

USSR

UDC 575.173:577.016

GERSHANOVICH, V. N., Institute of Epidemiology and Microbiology imeni  
N. F. Gamaleya, Academy of Medical Sciences USSR

"Repression by Catabolites in the Bacterial Cell"

Moscow, Uspekhi Sovremennoy Biologii, No 1, 1970, pp 49-71

Abstract: This review of the literature includes a discussion of the biochemical and genetic aspects of regulation of the synthesis of enzymes in the bacterial cell by catabolite repressors, the role of external conditions in the manifestation of catabolite repression, compounds that function as repressors and enzymes sensitive to repression by catabolites, the nature of catabolite repressors, permanent and transient repression by catabolites, and the mechanism of action of catabolite repressors. An attempt is made to reconcile the conflicting data on the participation of genetic regulatory units in the process of repressing the synthesis of inducible enzymes by carbon compounds.

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USSR

UDC 533.6.011.6

GERSHBEIN, E. A. (Moscow)

"Asymptotic Solution of the Equations of a Laminar Multicomponent Boundary Layer at Large Injections"

Moscow, Izvestiya Akademii Nauk SSSR, Mekhanika Zhidkosti i Gaza, No 2, 1973, pp 112-118

Abstract: Consideration is given to the two-dimensional and axisymmetric flows of a multicomponent compressible gas in a laminar boundary layer with a negative pressure gradient.

By means of the method of external and internal expansions is constructed an asymptotic solution of the equations of the boundary layer at large values of the injection parameter. The flow in the boundary layer is divided into a region adjacent to the surface of the body, in which the effects connected with molecular transfer in the first approximation (external expansion) do not influence the nature of the flow (the influence of these effects make itself felt in the second approximation), and into a region of molecular transfer, in which a transition takes place from flow in the wall region to

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USSR

GERSHBEIN, E. A., Izvestiya Akademii Nauk SSSR, Mekhanika Zhidkosti Gaza, No 2, 1973, pp 112-118

the flow of an ideal gas outside the boundary layer. An analytic solution of the external problem is obtained with given values of the flow rate of gas through the surface, the surface temperature, and the concentrations of the injected components. The formulation and some results of the numerical solution of the internal problem are presented.

A numerical solution is obtained of the initial equations of the laminar multicomponent boundary layer on a sphere and a round cylinder at large values of the injection parameter.

The asymptotic solution is compared with the numerical one, and the regions of its applicability are defined. 6 figures. 10 references.

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- 12 -

USSR

UDC: 681.92.94

GERSHBERG, I. M., KACHUR, M. M., LOZOVSKIY, A. M., Odessa Special Design  
Office of Polygraphic Machine Building

"An Installation for Applying a Photosensitive Layer to Form Plates"

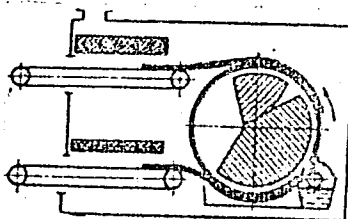
Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki,  
No 6, Feb 72, Author's Certificate No 328415, Division G, B, filed 5 Sep  
68, published 2 Feb 72, p 144

Translation: This Author's Certificate introduces an installation for  
applying a photosensitive layer to printing plates. The unit contains  
a predrying chamber for the plates, a means of rotating the plates, a  
tank with the photosensitive solution and a plate-drying chamber. As  
a distinguishing feature of the patent, the unit is designed for continu-  
ous application of the photosensitive layer. The means for rotating the  
plates is made in the form of an electromagnetic cylinder with magnetizing  
and demagnetizing sectors.

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USSR

GERSHBERG, I. M. et al., USSR Author's Certificate No 328415



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USSR

UDC 620.179.15

GERSHBERG, M. V., ZELENKOV, A. L., ILYUSHIN, S. V., PERVITSKIY, Yu. D.,  
RUDAKOV, V. N.

"The RT-68 Radiation Defectoscope"

Defektoskopiya, No 4, 1971, pp 115-121.

Abstract: A description is presented of the RT-68 commercial radiation defectoscope, designed for testing of glass reenforced plastic pipe and other types of pipe of similar dimensions. The defectoscope operates by the principle of mechanical scanning of the probe device, producing a visual picture of the distribution of defects. The device consists of the probe device with its lines, intermediate frequency amplifiers and power supply, the scanning mechanism of the probe device and the defect recording system, consisting of the visualization unit and beam scanning sensors. A block diagram and photograph of the device are presented.

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GERSHBEYN, YE. A.

LAMINAR TWO-DIMENSIONAL BOUNDARY LAYER WITH HIGH RATES OF INJECTION

Article by Ye. A. Gershbeyn, Moscow, Izvestiya Akademii Nauk SSSR, Mekhanika Zhidkosti i Gaza, Moscow, No. 1, 1976, signed to press 13 March 1968, pp. 64-73.

JPRS 56437

6 July 1972

The effect of high injection rates on a laminar boundary layer is investigated in connection with the re-entry of bodies into planet atmospheres at second and higher space velocities. The asymptotic solution of the equations of two-dimensional laminar boundary layer is presented for an arbitrary N-component gas mixture at high injection rates from the surface of the body.

The effect of high injection rates on the laminar boundary layer is important [1-4] in connection with the problem of the re-entry of bodies into the atmospheres of planets at second and higher cosmic velocities. Here the heat flows to a body reach substantial levels and its surface is rapidly destroyed. The numerical solutions of self-similar equations of the boundary layer are given [1, 2] for a homogeneous fluid with high injection rates. An asymptotic solution is found [3] for equations of pulses and binary diffusion at the critical point of a body with transfer coefficients constant across the boundary layer. The asymptotic solution of Prandtl equations has been found [4] for a homogeneous incompressible fluid with a negative pressure gradient and with injection parameter constant along the surface of a body. Presented in this article is the asymptotic solution of the equations of two-dimensional laminar boundary layer for an arbitrary N-component gas mixture at high injection rates from the surface of a body. Asymptotic equations are derived for the coefficient of friction, convective internal flow, for diffusion flows and gradients of component concentrations. The numerical solution of the boundary layer equations for the gas mixture  $O_2, N_2, CO, CN, HCN, C_2, C_3$  is given for the case of change of the injection parameter in the range  $0 \leq F_w \leq 30$ . The numerical and asymptotic solutions are compared and the ranges of application of the asymptotic equations are established. It is noted that the asymptotic

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GERSHBEYN, E. A., Moscow

"Laminar Multicomponent Boundary Layer With Large Air Flow"

Moscow, Mekhanika Zhidkosti i Gaza, No. 1, 1970, pp 64-73

Abstract: The effect of a large air flow on a laminar boundary layer was studied in connection with the problem of the entry of bodies into planetary atmospheres with second and higher cosmic velocities; heat flows to the body reach considerable values, and its surface is attacked. An asymptotic solution is given to the equations of a two-dimensional laminar boundary layer for an arbitrary  $N$ -component mixture of gases with large air flow from the surface of the body. Asymptotic formulas are obtained for the coefficient of friction, convective heat flow, diffusion flows, and gradients of the component concentrations. A numerical solution is obtained for the boundary layer equations for a mixture of O, N, O<sub>2</sub>, N<sub>2</sub>, CO, CN, HCN, C<sub>2</sub>, and C<sub>3</sub> gases under a change in the air flow parameter within the limits  $0 \leq -f_w \leq 30$ . The asymptotic solution is compared with the numerical solution and regions of applicability of the asymptotic formulas are established. It is shown

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USSR

GERSHBEYN, E. A., Mekhanika Zhidkosti i Gaza, No. 1, 1967, pp 64-73

that the asymptotic solution coincides with the numerical solution for those values of the air flow parameter for which the approximation of the boundary layer still remains valid. The behavior of the effective Schmidt numbers on the surface of the body and in the boundary layer under a change in the air flow parameter is also investigated.

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USSR

UDC: 517.934.1

GERSHCHENKO, Ye. I., and GUSTOMESOV, V. A. (Sverdlovsk Department of the Steklov Mathematical Institute)

"Analysis of a Discrete Relay System on a Phase Plane"

Minsk, *Differentsial'nyye Uravneniye* (Differential Equations), Vol 6, No 9, September 1970, pp 1587-1598

Abstract: The phase-plane method is used to investigate a second-order relay system having a piecewise constant control varying at discrete equal time intervals. Qualitatively, the mapping point appears initially in the neighborhood of the coordinate origin, where complex multifrequency (periodic or aperiodic) motion becomes established. The author examines the switching region and simple limit cycles. Switching occurs within a defined region described by self-similar parabolic segments. The system is described within a coordinate system in which the trajectories in the 2nd and 4th quadrants are mapped onto each other according to the Cauchy equation. The possible motions of the mapping point are illustrated and discussed in detail, as are the steady-state motions of the system. Orig. art. has 4 figures and 2 references.

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USSR

UDC 621.983.3

GESHELIN, V. G.

"Results of a Study of Technological Methods for Evaluating the Deep Drawability of Steel"

Moscow, Kuznechno-Shtampovochnoye Proizvodstvo, No 8, Aug 71, pp 15-18

**Abstract:** The author uses methods of mathematical statistics and multiple testing to determine instrumental errors of various deep-drawing test devices based on the Erichsen, Swift, Engelhardt, and Fuqua methods and the biaxial hydrostatic tension method. The instruments include the mechanical PTL and double-action hydraulic presses 140-12Mr and MFL-10G for use with the Erichsen method, the double-action hydraulic press of TsNIITMASH [Central Scientific Research Institute of Technology and Machine Building] for the Swift method, the triple-action TTsP hydraulic press for the Engelhardt method, a TsD-10 testing machine with a special instrument for the Fuqua method, and an experimental double-action hydraulic press for biaxial hydrostatic tension. Numerous tests were performed on automobile sheet steel 08Yu, cate-

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USSR

GESHELIN, V. G., Kuznechno-Shtampovochnoye Proizvodstvo, No 8, Aug 71, pp 15-18

gory OSV, 0.7, 0.8, 0.9, and 1 mm thick (All-Union State Standard 9045-59), fabricated by the Zaporozh'ye Metallurgical Plant, as well as sheet steel from West Germany with similar mechanical properties. The metal was selected at the Zaporozh'ye Motor Vehicle Plant during the complex drawing of parts for the "Zaporozhets" automobile.

The results indicate that measurement accuracy and sensitivity of the Erichsen method using the PTL instrument are low. The accuracy and sensitivity of the MTL-10G and 140-12Mr instruments can be increased over 30 percent by automating the recording of the cup draw depth at the moment the load drops. The Engelhardt method has approximately the same sensitivity as the Erichsen method, but 20 percent less accuracy. Tests according to the Swift method give considerable information on the properties of the sheet metal only with respect to its drawing. This method is almost twice as accurate and sensitive as the Erichsen method, but is much more complicated and laborious.

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USSR

GESHELIN, V. G., Kuznechno-Shtampovochnoye Proizvodstvo, No 8, Aug 71, pp 15-18

The accuracy of measurements according to the Fuqua method is four times higher and sensitivity three times higher than according to the Erichsen method, and almost twice as high as according to the Swift method, and the method is simple. The properties of automobile sheet steel under conditions closest to production punching can be evaluated by means of hydrostatic biaxial tensile tests. Despite the low accuracy of the method, its high sensitivity, coupled with the high sensitivity of the sheet metal to the degree of its physical and geometric inhomogeneity, singles it out, along with the Fuqua method, as one of the effective and important methods for an objective evaluation of the punchability of cold-rolled automobile sheet steel.

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AA0046398-

GERSHENGOREN L.R.

UR 0482

Soviet Inventions Illustrated, Section II Electrical, Derwent,

1/70

242467 DEFECTOSCOPE CARRIAGE ensuring that the gap between the pick-up and the surface of examined article remains constant over a wide range of article diameters, includes a rotating faceplate with an articulated and spring-loaded lever at the end of which there is a body with two rollers a spring and a fork with an additional roller to which a pick-up head is attached.

12.8.66 as 1097681/25-28.L.P.GERSHENFOREN et al.

NON-DESTRUCTIVE METHODS & MEDIA FOR CONTROL OF

MATERIALS QUALITY RES.INST. (8.9.69) Bul 15/25.4.69.

Class 42k. Int.Cl.G 01 n.

MT

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19781588

AA0046398

AUTHORS: Gershengoren, L. R.; Ivanov, V. Ye.; Chernobel'skiy, A. A.

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Materialov

7/2  
19781589



1/2 030 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--PROSPECTS FOR USING LOW TEMPERATURES IN POWER ENGINEERING -U-  
AUTHOR--(03)-SYCHEV, V.V., KIRYENIN, I.A., ~~GERSHENKROV, V.L.~~  
COUNTRY OF INFO--USSR  
SOURCE--MOSCOW, IZVESTIYA AKADEMII NAUK SSSR: ENERGETIKA I TRANSPORT, NO  
1, 1970, PP 35-45  
DATE PUBLISHED-----70  
SUBJECT AREAS--ENERGY CONVERSION (NON-PROPULSIVE), PHYSICS, ELECTRONICS  
AND ELECTRICAL ENGR.  
TOPIC TAGS--CRYOGENIC ELECTRONICS, ELECTRIC POWER TRANSMISSION,  
SUPERCONDUCTIVITY, TRANSMISSION LINE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1999/1328 STEP NO--UR/0281/70/000/001/0035/0045  
CIRC ACCESSION NO--AP0123286  
UNCLASSIFIED

2/2 030

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0123286

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. PROBLEMS ASSOCIATED WITH THE ESTABLISHMENT OF SUPERCONDUCTING AND CRYOGENIC ELECTRIC TRANSMISSION LINES ARE DISCUSSED. ADEQUATE ATTENTION IS GIVEN TO TYPE OF CURRENT AND LINE DESIGN (CABLES). SPECIAL ATTENTION IS PAID TO TECHNICO ECONOMIC AND PHYSICO TECHNICAL PROBLEMS WHICH PLAY A DETERMINING ROLE IN THE DESIGN AND PLANNING OF SUPERCONDUCTING AND CRYOGENIC LINES. A DESCRIPTION IS GIVEN OF THE CRYOGENIC CIRCUITS WHICH CAN ENSURE THE PRECOOLING OF CABLES AND MAINTAIN THEIR OPERATING TEMPERATURE DURING OPERATION. AN ANALYSIS IS MADE OF THE PROSPECTIVE DEVELOPMENT OF ELECTRIC MACHINES (MOTORS AND GENERATORS) WITH SUPERCONDUCTING WINDINGS AND OF SUPERCONDUCTING ENERGY STORING DEVICES.

UNCLASSIFIED

UDC 628.33/.36 + 541.15

USSR

DZHAGATSPANYAN, R. V., GERSHENOVICH, A. I., and FILIPPOV, M. T.

"Radiation Purification of Sewage"

Moscow, Zhurnal Vsesoyuznogo Khimicheskogo Obshchestva Imeni D. I. Mendeleyev,  
Vol 17, No 2, 1972, pp 177-184

Abstract: A review with 12 references devoted to the utilization of high energy radiation in purification of sewage. It covers the questions of the acceleration of the sedimentation of suspensions, removal of phenols, decomposition of cyanides, radiation disinfection, and purification of the sewage from synthetic surfactant materials resistant to biological oxidation. Economical cost analysis of the method has been covered on the basis of literature reports. Synergism between the radiation and biological oxidation methods was discussed as well as the sources of radiation adaptable to sewage purification.

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1/2 010 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--ALKYL OR PHENYLALKYL SULFONATE ESTERS -U-  
AUTHOR--(03)-KOSTYUCHENKO, V.M., MITROFANOV, M.G., GERSHENOVICH, A.I.  
COUNTRY OF INFO--USSR  
SOURCE--U.S.S.R. 218,882  
REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI 1970,  
DATE PUBLISHED--10FEB70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--CHEMICAL PATENT, SULFONIC ACID, ESTER, ALKYL RADICAL, PHENOL,  
BENZENE DERIVATIVE, CHEMICAL SYNTHESIS  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--3006/1597 STEP NO--UR/0482/70/000/000/0000/0000  
CIRC ACCESSION NO--AA0135238  
UNCLASSIFIED

2/2 010 UNCLASSIFIED PROCESSING DATE--27NOV70  
CIRC ACCESSION NO--AA0135238  
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE TITLE COMPODS. ARE PREPD. BY  
TREATING N,PARAFFIN SULFONYL CHLORIDES CONTG. C SUB2 -C SUB4 WITH ALCS.  
CONTG. C SUB8 -C SUB16 OR WITH ALKYLPHENOLS CONTG. C SUB8 IN THE SIDE  
CHAIN. THE REACTION IS CARRIED OUT. IN THE PRESENCE OF NH SUB3 AT  
SMALLER THAN 50DEGREES. FACILITY: VOLGOGRADSKIY  
NAUCHNO-ISSLEDOVATEL'SKIY INSTITUT NEFTYANDY I GAZOVOY PROMYSHLENNOSTI.

UNCLASSIFIED

1/2 030 UNCLASSIFIED PROCESSING DATE--09OCT70  
TITLE--CORROSION OF CONSTRUCTION MATERIALS DURING THE SULFOXIDATION OF  
HYDROCARBONS -U-  
AUTHOR--(05)--BALAKIREV, YE.S., OSTROUMOVA, V.V., GERSHENOVICH, A.I.,  
DZHAGATSPANYAN, R.V., KHROMENKOV, L.G.  
COUNTRY OF INFO--USSR  
SOURCE--ZASHCH. METAL. 1970, 6(2), 224  
DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--STEEL CORROSION, STAINLESS STEEL, ALLOY DESIGNATION, CORROSION  
RATE, CORROSION RESISTANCE, SULFOXIDE, LEAD ALLOY, HYDROCARBON, SULFONIC  
ACID/(U)SO LEAD ALLOY, (U)KH18N12M2T STAINLESS STEEL, (U)OKH23N28M3D3T  
STAINLESS STEEL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1992/0749

STEP NO--UR/0365/70/006/002/0224/0224

CIRC ACCESSION NO--AP0111942

UNCLASSIFIED

2/2 030  
CIRC ACCESSION NO--AP0111942

UNCLASSIFIED

PROCESSING DATE--09OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IN THE HG PHOTOCHEM. SULFOXIDN. OF ALIPHATIC C SUB10-20 HYDROCARBONS, SATISFACTORY CORROSION RESISTANCE WAS FOUND FOR STEEL OKH23N28M3D3T OR KH18N12M2T, OR PB S-U, THE CORROSION RATES BEING 0.040, 0.048, AND 0.034 G-M PRIME2-HR. DURING THE ALC. EXTN. OF THE SULFONIC ACIDS, THE CORROSION RATES FOR THE STEELS WERE 0.00075 G-M PRIME2-HR.

UNCLASSIFIED

1/2 023 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--CATABOLITE REPRESSION OF ENZYME SYNTHESIS IN MUTANTS OF ESCHERICHIA  
COLI WITH A DEFECT IN THE CARBOHYDRATE TRANSPORT SYSTEM -U-  
AUTHOR-(G4)-GERSHAGOVICH, V.N., YUROVITSKAYA, N.V., SAPRYKINA, T.P.,  
KLYUCHOVA, V.V.  
COUNTRY OF INFO--USSR  
SOURCE--DOKL. AKAD. NAUK SSSR 1970, 190(5), 1232-4  
DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--BACTERIA MUTATION, ESCHERICHIA COLI, CULTURE MEDIUM, ENZYME,  
CARBOHYDRATE, BIOLOGIC TRANSPORT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1999/0705

STEP NO--UR/0020/70/190/005/1232/1234

CIRC ACCESSION NO--AT0122791

UNCLASSIFIED



2/2 023

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AT0122791

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SYNTHESIS OF BETA GALACTOSIDASE BY E. COLI MUTANT P-34 GROWN IN A MEDIUM CONTG. ME THIOMALACTOSIDE WAS REDUCED TO 46-33PERCENT OF NORMAL BY GLUCOSE. THIS INDICATES THAT GLUCOSE DIRECTLY REPRESSES THE ENZYME OF THE LAC OPERON AND THAT ITS COMPETITIVE BLOCKING OF GALACTOSE TRANSPORT IS A SECONDARY EFFECT, SINCE THE NORMAL GALACTOSE TRANSPORT SYSTEM IS LACKING IN P-34. GLUCOSE SLIGHTLY STIMULATES THE SYNTHESIS OF TRYPTOPHANASE AND SERINE DEAMINASE BY P-34 GROWN IN MEDIA CONTG. TRYPTOPHAN AND SERINE, RESP., ALTHOUGH IT REPRESSES THE SYNTHESIS OF THESE ENZYMES BY UNMUTATED E. COLI. THUS, THESE ENZYMES ARE LESS SENSITIVE TO GLUCOSE REPRESSION THAN IS BETA GALACTOSIDASE. FACILITY: INST. EPIDEMIOLOG. MIKROBIOLOG. IM. GAMALEI, MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 612.015.3.599.323.4

MENDZHERITSKAYA, L. G., and GERSHENOVICH, Z. S., Department of Physiology and Biochemistry of Man and Animals, Rostov-na-Donu State University

"Nitrogen Metabolism in the Rat Brain After Oxygen Poisoning and the Protective Action of Serotonin"

Moscow, Biologicheskiye Nauki, No 8, 1971, pp 45-49

Abstract: Injection of rats with serotonin (1 mg/100 g) 15 min before exposure to oxygen (6 atm) markedly delayed the onset of convulsions. The latter set in 15 to 25 min after oxygen poisoning in the control compared with 60 to 100 min in the experimental animals. Fifteen minutes after the injection of serotonin, the amount of ammonia in the brain increased while that of glutamine decreased proportionately. There was also a sharp decrease in the amidation of proteins and in the concentration of gamma aminobutyric and aspartic acids. The indexes of nitrogen metabolism tended to return to normal 90 min after the injection of serotonin. The protective action of serotonin in oxygen poisoning is related to the predominance of reduced products (ammonia, NAD-H<sub>2</sub>) over oxidized ones.

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USSR

UDC 612.822.1.015.33:612.58

SHUGALEI, V. S., KRICHEVSKAYA, A. A., and GERSHENOVICH, Z. S., Chair of Biochemistry, Rostov State University

"The Resistance of Hibernating Hamsters (*Cricetus auratus*) to the Effect of Increased Oxygen Pressure"

Leningrad, Zhurnal Evolyutsionnoy Biokhimii i Fiziologii, Vol 6, No 5, Sep/-Oct 70, pp 523-526

Abstract: The effect of oxygen at a pressure of 5 atm on hibernating and nonhibernating hamsters was studied. The content of ammonia, urea, glutamine and gamma-aminobutyric, aspartic, and glutamic acids in the brain was determined. Winter hibernation was found to protect the animals against the toxic effects of oxygen under pressure; the animals were not aroused during 8 hours of hyperoxia. The concentration of low-molecular-weight nitrogen compounds in the brain did not differ from that found in animals hibernating under usual conditions. Urea may stabilize proteins, as is indicated by the increased urea content found in the brain tissue. This enhanced stability of brain protein may be the basis for the resistance of the entire organism of the hibernating animal to the effects of extreme conditions.

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USSR

GERSHENZON, M. A.

"Numerical Dynamic Models of the Interbranch Balance, Formulated on the Basis of General and Growth Coefficients of Capital Requirements"

Probl. Optimiz. Ekon. Resheniy [Problems of Optimization of Economic Decisions -- Collection of Works], Novosibirsk, 1971, pp 181-212, (Translated from Referativnyy Zhurnal, Kibernetika, No 3, 1972, Abstract No 3 V447).

NO ABSTRACT.

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USSR

UDC: 51:330.115

GERSHENZON, M. A., MIRKIN, B. G.

"On Cost Recovery of Capital Expenditures in the Intersectoral Dynamic Model"

V sb. Probl. narodnokhoz. optimuma (The Problem of the National Economic Optimum--collection of works), vyp. 3, ch. 1, Novosibirsk, 1970, pp 176-195 (from RZh-Kibernetika, No 7, Jul 71, Abstract No 7V644)

Translation: A model constructed on the basis of coefficients of incremental output-capital ratio is used for studying some properties of sectoral indices of cost recovery and their effect on stability. D. Epshiteyn.

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USSR

UDC 575.111:575.24:576.312.36:595.773.4

ALEKSANDROV, Yu. N., ~~GERSHENZON, S. M.~~, and MALYUTA, S. S., Molecular Biology and Genetics Sector, Academy of Sciences UkSSR, Kiev

"Mutagenic Properties of DNA- and RNA-Containing Viruses Nonvirulent for *Drosophila*"

Moscow, Genetika, No 9, 1971, pp 102-111

Abstract: Silkworm nuclear polyhedrosis, poliomyelitis, and influenza viruses, which are nonvirulent for *Drosophila* and do not reproduce in this insect, and the DNA of nuclear polyhedrosis virus induced lethal mutations in the sex and second chromosomes. The complementation test revealed a high degree of allelism of the lethals induced by the viruses, an indication of some selectivity of their action. Cytogenetic analysis of the chromosomes in the salivary glands of *Drosophila* larvae disclosed only a small number of chromosomal aberrations, suggesting that the lethal mutations were very slight gene deletions or mutations. The nucleic acids apparently play a major role in the induction of mutations by viruses that are not infectious for *Drosophila*.

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Genetics

USSR

GERSHENZON, S.M., Corresponding Member, Academy of Sciences USSR

"Mutagenic Action of Biopolymers and Virus"

Kiev, Vestnik Akademii Nauk Ukrainskoy SSR, Vol 34, No 2, 1970, pp 70-77

Abstract: Drosophila larvae fed DNA showed results different from those produced by other mutagens. Structural changes, color of eyes, etc. were altered and these specific changes were transmitted to progeny. Work in the U.S. and other countries has confirmed this fact. It is probable that exogenous DNA, as an episome, attaches to a part of the chromosome, destabilizes it, and induces mutability in a manner similar to that of a virus. It is possible to introduce DNA to cause a desired change, which is done in production of phages and other proteins in the synthesis of macromolecules. Ability to cause mutations is the universal property of the virus. Since a virus works with DNA in a protein coat causing inner changes which ultimately destroy the host, it is possible to assume a virus which causes mutations without destroying the host. If such a condition could be proved, it would be of immense significance to theory and practice. Vitology is now so extensive that it might lead to discovery of mutagens other than those indispensable in selection and evolution. It would be highly desirable to establish hereditary transmission of beneficial mutagens. It may be possible to

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USSR

GERSEENZON, S.M., Vestnik Akademii Nauk Ukrainskoy SSR, Vol 34, No 2, 1970,  
pp 70-77

transmute the infectious virus into a working virus. Finally, the use of vaccines in altering the genes should also be considered, especially if their immunological effect could be freed from the DNA and limited to the protein coat of the virus.

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USSR

UDC: 621.315.592

GERSHENZON, Ye. M., IL'IN, V. A., KURILENKO, I. R., and LITVIN-  
GORSKAYA, L. B.

"Reluctance in n-InSb With a Conductance Impurity"

Leningrad, Fizika i tekhnika poluprovodnikov, No 10, 1972, pp 1868-  
1875

Abstract: The purpose of this paper is to set up a connection between the nature of the reluctance, as a function of the magnetic field and the temperature, and the electrical conductivity mechanisms of a semiconductor. The semiconductor used for the experiments described in the paper was n-InSb since all characteristic dependences of the reluctance can be realized in this material with comparatively weak magnetic fields. The transverse and longitudinal reluctances were investigated in the temperature range of 0.5-10° K and at magnetic fields of 0-5000 oersteds. A description of the preparation of the specimens is given together with a table of their parameters. Differences in the temperature behavior of the reluctance of specimens with various types of conductivity as well

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USSR

GERSHENZON, Ye. M., et al., Fizika i tekhnika poluprovodnikov, No 10, 1972,  
pp 1866-1873

as both positive and negative reluctance in those specimens are  
discussed. The authors thank V. S. Ivlev for preparing the n-InSb  
specimens.

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USSR

UDC: 621.315.592

GERSHENZON, Ye. M., IL'IN, V. A., LITVAK-GORSKAYA, L. B.,  
KABINOVICH, R. I., and SHAPIRO, Ye. Z.

"Dispersion of Hot Electrons in n-InSb at Low Temperatures"

Leningrad, Fizika i tekhnika poluprovodnikov, No 10, 1972, pp 1888-1894

Abstract: The purpose of this paper is to study the mechanisms of hot-electron dispersion in n-type InSb in a broad range of electric fields, and to compare the results of this study with the results of theoretical research. By so doing, the authors hope to clear up some of the mystery surrounding the dispersion of energy and impulse of hot electrons in InSb at temperatures much below the limiting frequency of the optical phonon. They investigate the dependence of their specimens' conductivity, Hall constant, and particle mobility, on the intensity of the electric field at temperatures of 1.3-4.2° K and at field intensities ranging from 1-400 V/cm. The specimens, whose parameters are given in a table, were made with markedly different concentrations of impurities and compensations. Curves are given for the dependences noted above.

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USSR

UDC: 621.315.592

GERSHENZON, Ye. M., IL'IN, V. A., LITVAK-GORSKAYA, L. B.,  
RABINOVICH, R. I., and SHAPIRO, Ye. Z.

"Determining Separate Concentrations of Impurities in Type A<sup>III</sup>B<sup>V</sup>  
Compounds by Electron Heating"

Leningrad, Fizika i tekhnika poluprovodnikov, No 10, 1972, pp 1906-1910

Abstract: A method is developed for determining separate concentrations of impurities in compounds of the A<sup>III</sup>B<sup>V</sup> type from the magnitude of the hot electron mobility and the dependence of the mobility on the electric field intensity. Earlier papers have shown that at low temperatures in such compounds, there is a range of electric field intensities in which this dependence is weak. Two possibilities that may then arise are considered: the carrier concentration is such that the electron-electron interaction may be neglected; the electron concentration is high and the electron-electron interaction must be taken into account. Diagrams for finding the total concentration of impurities from the experimental value of the mobility are given. Also given is the diagram and explanation of a device for verifying this method in the case of some n-InSb and n-GaAs specimens. The authors express their thanks to  
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USSR

UDC: 621.315.592

GERHSENZON, Ye. M., et al, Fizika i tekhnika poluprovodnikov, No 10, 1972, pp 1906-1910

V. S. Ivleva, A. N. Telegin, and L. D. Sobanova for preparing the N-InSb and epitaxial n-GaAs films for the verifying tests.

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USSR

UDC: 621.317.757

GERSHENZON, Ye. M., NEGIREV, A. A., PUTILOV, P. A., TUMANOV, B. N.

"An Autodyne Radio Spectrometer"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 26,  
1970, Soviet Patent No 278797, Class 21, filed 2 Dec 68, p 47

Abstract: This Author's Certificate introduces an autodyne radio spectrometer for the submillimeter wavelength range which contains a source of SHF oscillations, with a phase shifter and attenuator connected to this source. As a distinguishing feature of the patent, the measurement precision is improved by using a backward wave tube with dc-isolated decelerating system and collector as the SHF source.

1/2 016 UNCLASSIFIED PROCESSING DATE--18SEP70  
TITLE--CONTRIBUTION OF IMPURITY STATES TO THE ELECTRICAL CONDUCTIVITY OF N  
INDIUM ANTIMONIDE AT LOW TEMPERATURES -U-  
AUTHOR--(03)-BANNAYA, V.F., GERSHENZON, YE.M., LITVAKGORSKAYA, L.B.

CCUNTRY OF INFO--USSR

SOURCE--FIZ. TEKH. POLUPROV. 1970, 4(1) 200-7

DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--IMPURITY BAND, ELECTRIC CONDUCTION, CRYSTAL LATTICE  
VIBRATION, INDIUM ANTIMONIDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRA--1983/1825

STEP NO--UR/0449/70/004/001/0200/0207

CIRC ACCESSION NO--AP0054659

UNCLASSIFIED

2/2 016

UNCLASSIFIED

PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0054659

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE TEMP. DEPENDENCES OF ELEC. COND. AND HALL COEFF. OF MAX. REFINED AND SPECIALLY COMPENSATED N TYPE INSB SAMPLES WERE STUDIED IN WEAK MAGNETIC FIELDS AT 0.32-20DEGREESK. THE EXPTL. RESULTS CAN BE EXPLAINED WITH CONSIDERATION OF COND. IN THE CONDUCTION AND IMPURITY BANDS. ON THE BASIS OF THE 2 BAND CONDUCTION MODEL, THE TEMP. DEPENDENCE WAS DETD. OF THYRATIO OF ELECTRON CONCNS. IN THE 2 BANDS. THE TOTAL CONC. AND IONIZATION ENERGY OF IMPURITIES,  $E_{SUBD}$ , WERE CALCD., AND IT WAS FOUND THAT  $E_{SUBD}$  INCREASES WITH INCREASING COMPENSATION. THE CONTRIBUTION TO THE MOBILITY FROM CARRIER SCATTERING ON LATTICE VIBRATIONS WAS ESTD. AT 77DEGREESK.

UNCLASSIFIED



1/2 023 UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--FIELD DEPENDENCE OF THE CONCENTRATION OF CARRIERS IN GERMANIUM  
UNDER INTRINSIC PHOTOEXCITATION CONDITIONS -U-  
AUTHOR-(C4)-GERSHENZON, YE.M., GUSINSKIY, E.N., RABINOVICH, R.I., SOINA,  
N.V.  
CCOUNTRY OF INFO--USSR

SOURCE--FIZ. TVERD. TELA 1970, 12(4), 969-74

DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--GERMANIUM, ELECTRON, PHOTOEFFECT, LIGHT EXCITATION, CYCLOTRON  
RESONANCE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--3001/0350

STEP NO--UR/0181/70/012/004/0969/0974

CIRC ACCESSION NO--AP0126106

UNCLASSIFIED

2/2 023

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0126106

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. RESULTS ARE GIVEN AND DISCUSSED OF THE MEASUREMENTS OF THE FIELD DEPENDENCE OF CONCN. OF HOT ELECTRONS AND HOLES IN PURE GE AT 4.2 DEGREE SK. THE MEASUREMENTS WERE CARRIED OUT BY THE METHOD OF CYCLOTRON RESONANCE, WHICH ALLOWS ONE TO STUDY THE SEP. FIELD DEPENDENCES OF THE CONCN. OF ELECTRONS AND HOLES. THE CARRIER CONCN. NECESSARY FOR THE MEASUREMENTS WAS CREATED BY LIGHT WITH WAVELENGTHS  $\lambda$  IS LARGER THAN OR EQUAL TO 1.65  $\mu$  (VOL. EXCITATION) AND  $\lambda$  EQUALS 0.8  $\mu$  (SURFACE EXCITATION). THE CONCN. OF ELECTRONS IS INDEPENDENT OF THE ABSORBED MICROWAVE POWER IN THE SURFACE AS WELL AS VOL. EXCITATION. THE CONCN. OF HOLES IS INDEPENDENT OF THE POWER IN THE SURFACE EXCITATION AND INCREASES CONSIDERABLY WITH THE POWER IN THE VOL. EXCITATION. DEPENDENCES OBSD. IN THE VOL. EXCITATION CAN BE EXPLAINED BY ASSUMING THAT RECOMBINATION OF CARRIERS TAKES PLACE ON THE DEEP LYING IMPURITIES. THE ENERGY DEPENDENCE OF THE COEFF. OF CAPTURE OF HOLES ON DEEP CENTERS EXHIBITS CORRESPONDENCE WITH THE LAX THEORY FOR H LIKE IMPURITIES. FACILITY: MOSK. GUS. PEDAGOG. INST. IM. LENINA, MUSCCW, USSR.

1/3 030 UNCLASSIFIED PROCESSING DATE--C4DEC70  
TITLE--STUDY OF THE KINETICS OF PHOTOCONDUCTIVITY OF GERMANIUM UNDER THE  
CONDITIONS OF CYCLOTRON RESONANCE -U-  
AUTHOR-(03)-GERSHENZON, YE.M., MELNIKOV, A.P., SHIMICHEVA, E.L.

COUNTRY OF INFO--USSR

SOURCE--LENINGRAD, FIZIKA I TEIHNKA POLUPROVODNIKOV, VOL 4, NO 5, 1970,  
PP 892-899  
DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--PHOTOCONDUCTIVITY, GERMANIUM SEMICONDUCTOR, CYCLOTRON  
RESONANCE, KINETIC THEORY, RECOMBINATION LUMINESCENCE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY FICHE NO----FD70/605010/B08 STEP NO--UR/0449/70/004/005/0892/0899

CIRC ACCESSION NO--AP0140112

UNCLASSIFIED

2/3 030

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0140112

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THIS ARTICLE CONTAINS RESULTS OF INVESTIGATING THE KINETICS OF PHOTOCONDUCTIVITY OF GE UNDER THE CONDITIONS OF CYCLOTRON RESONANCE AT A FREQUENCY OF 10 PRIME10 HERTZ FOR HELIUM TEMPERATURES. A PROCEDURE IS PROPOSED FOR INVESTIGATING THE NONEQUILIBRIUM PROCESSES IN SEMICONDUCTORS SEPARATELY FOR ELECTRONS AND HOLES. THE PHOTOCONDUCTIVITY RELAXATION TIME  $\tau_{rel}$  OF ELECTRONS AND HOLES IN PURE GE IS STUDIED AS A FUNCTION OF TEMPERATURE AND LIGHT INTENSITY OF THE EXCITING CARRIER. IT IS DEMONSTRATED THAT BOTH IN P TYPE AND IN N TYPE GERMANIUM, RECOMBINATION TAKES PLACE ON THE DEEP CENTERS. THE ELECTRONS ARE CAPTURED BY NEUTRAL CENTERS, AND THE HOLES, BY IONIZED CENTERS. THE PHOTOCONDUCTIVITY RELAXATION TIME IS DETERMINED BY THE VARIATION IN FILLING OF THE SHALLOW CENTERS DURING THE DARK INTERVAL BETWEEN THE LIGHT PULSES. THE CALCULATION CORRESPONDING TO THIS MODEL IS CARRIED OUT FOR THE ELECTRON PHOTO CONDUCTIVITY PULSE. THE CALCULATED TEMPERATURE RELATIONS OF  $\tau_{rel}$  ARE ANALOGOUS TO THE RELATIONS OBSERVED IN THE EXPERIMENT. IT IS POINTED OUT THAT THE NATURE OF EFFECT OF THE INTENSITY OF CONSTANT ILLUMINATION ON THE FORM OF THE CYCLOTRON RESONANCE SPECTRUM MAKES IT POSSIBLE TO PROPOSE THE SIMPLEST SINGLE LEVEL RECOMBINATION SCHEME FOR NONEQUILIBRIUM CARRIERS IN PURE GE. THE RECOMBINATION OF FREE ELECTRONS AND HOLES PROCEEDS VIA THE DEEP CENTERS CORRESPONDING TO THE UNCONTROLLED ADMIXTURE. WITHIN THE FRAMEWORK OF THE ADOPTED MODEL IT IS ALSO POSSIBLE TO EXPLAIN THE PROTRACTION OF THE PHOTOCONDUCTIVITY FALLOFF TIME FOR HOLES IN THE P TYPE SAMPLES.

UNCLASSIFIED

3/3 030

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0140112

ABSTRACT/EXTRACT--THE STATIONARY STATE OF THE ILLUMINATED SAMPLE  
CORRESPONDS TO A LARGER NUMBER OF RECOMBINATION CENTERS FOR HOLES THAN  
IN THE DARK. PROTRACTION OF THE PHOTO CONDUCTIVITY PULSE FALLOFF TIME  
IS CONNECTED WITH CHARGE EXCHANGE OF THE RECOMBINATION CENTERS BY HOLES  
RELEASED FROM THE SHALLOW ACCEPTORS.

UNCLASSIFIED

1/2 024 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--EFFECT OF THE CAPTURE MECHANISM ON THE CYCLOTRON RESONANCE LINE  
SHAPE OF HOT CARRIERS -U-  
AUTHOR-(04)-GERSHENZON, YE.M., GUSINSKIY, E.N., RABINOVICH, R.I., SOINA,  
N.V.  
COUNTRY OF INFO--USSR  
SOURCE--FIZ. TVERD. TELA 1970, 12(3), 739-44  
DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--CYCLOTRON RESONANCE, THERMAL EFFECT, CARRIER DENSITY, LINE  
WIDTH, ACOUSTIC SCATTERING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1987/1986

STEP NO--UR/0181/70/012/003/0739/0744

CIRC ACCESSION NO--AP0105060

UNCLASSIFIED

2/2 024

UNCLASSIFIED

PROCESSING DATE--30UCT70

CIRC ACCESSION NO--AP0105060

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE LINE SHAPE WAS STUDIED OF CYCLOTRON RESONANCE OF HOT CARRIERS UNDER CONDITIONS WHEN THEIR CONC. VARIES ON HEATING. CASES WERE ANALYZED OF CONST. AND VARIABLE (WITH HEATING) CONCNS. OF RECOMBINATION CENTERS. THE ENERGY DEPENDENCE OF THE CAPTURE COEFF.  $\alpha(\epsilon)$  CONSIDERABLY AFFECTS THE SHAPE OF THE CYCLOTRON RESONANCE LINE AND THE DEPENDENCE OF ITS HALFWIDTH ON THE POWER. EXPRESSIONS ARE OBTAINED FOR THE SHAPE OF THE CYCLOTRON RESONANCE LINE UNDER THE CONDITIONS OF ACOUSTICAL SCATTERING AND  $\alpha(\epsilon)$  VARIES DIRECTLY AS  $\epsilon^{-1}$ . IN THIS CASE, THE DEPENDENCE OF THE HALFWIDTH OF THE LINE ON THE POWER IS THE SAME AS AT CONST. CONC. OF CARRIERS. DATA ARE GIVEN FROM EXPTS. ON HEATING OF HOLES IN PURE GE WHEN THEIR CONC. CHANGES WITH THE POWER.

FACILITY: MOSK. GOS. PEDAGOG. INST. IM. LENINA, MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 621.315.592

G  
GERSHENZON, Ye.M., MEL'NIKOV, A.P., SHIMICHEVA, E.L.

"Study of the Kinetics of Photoconductivity of Germanium under the Conditions of Cyclotron Resonance"

Leningrad, Fizika i Tekhnika Poluprovodnikov, Vol 4, No 5, 1970, pp 892-899

Abstract: This article contains results of investigating the kinetics of photoconductivity of Ge under the conditions of cyclotron resonance at a frequency of  $10^{10}$  Hertz for helium temperatures. A procedure is proposed for investigating the nonequilibrium processes in semiconductors separately for electrons and holes. The photoconductivity relaxation time  $\tau_{rel}$  of electrons and holes in pure Ge is studied as a function of temperature and light intensity of the exciting carrier. It is demonstrated that both in p-type and in n-type germanium, recombination takes place on the deep centers. The electrons are captured by neutral centers, and the holes, by ionized centers. The photoconductivity relaxation time is determined by the variation in filling of the shallow centers during the dark interval between the light pulses. The calculation corresponding to this model is carried out for the electron photoconductivity pulse. The calculated temperature relations of  $\tau_{rel}$  are analogous to those observed in the experiment.



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GERSHENZON, Ye.M., et al., Fizika i Tekhnika Poluprovodnikov, Vol 4, No 5, 1970, pp 892-899

It is pointed out that the nature of effect of the intensity of constant illumination on the form of the cyclotron resonance spectrum makes it possible to propose the simplest single-level recombination scheme for nonequilibrium carriers in pure Ge. The recombination of free electrons and holes proceeds via the deep centers corresponding to the uncontrolled admixture. Within the framework of the adopted model it is also possible to explain the protraction of the photoconductivity falloff time for holes in the p-type samples. The stationary state of the illuminated sample corresponds to a larger number of recombination centers for holes than in the dark. Protraction of the photoconductivity pulse falloff time is connected with charge exchange of the recombination centers by holes released from the shallow acceptors.

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1/2 026 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--SOME FEATURES OF ESR AND SPIN LATTICE RELAXATION OF ELECTRONS IN GE  
AND INSB WITH DIFFERENT DONOR CONCENTRATIONS -U-  
AUTHOR-(03)-GERSHENZON, E.M., PEVIN, N.M., FOGELSON, M.S.

COUNTRY OF INFO--USSR

SOURCE--PHYSICA STATUS SOLIDI, 1970, VOL 38, NR 2, PP 865-870

DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--SPIN LATTICE RELAXATION, ELECTRON, GERMANIUM, INDIUM ARSENIDE,  
WAVE FUNCTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1989/0949

STEP NO--GE/0030/70/038/002/0865/0870

CIRC ACCESSION NO--AP0107478

UNCLASSIFIED

2/2 026

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0107478

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CONCENTRATION AND TEMPERATURE  
DEPENDENCE OF THE ESR LINEWIDTH IN N-GE AND N-INSB AND SPIN LATTICE  
RELAXATION TIMES IN GE:AS HAVE BEEN INVESTIGATED IN THE X BAND. ESR  
LINE NARROWING AND THE INCREASE OF THE SPIN LATTICE RELAXATION RATE WITH  
CONCENTRATION IN THE LOW CONCENTRATION RANGE ARE EXPLAINED BY OVERLAP OF  
THE DONOR ELECTRON WAVE FUNCTIONS. IN THE HIGH CONCENTRATION RANGE THE  
ESR DATA ARE COMPARED WITH THE THEORIES OF THE SPIN RELAXATION OF  
CONDUCTION ELECTRONS. FACILITY: LENIN STATE PEDAGOGICAL  
INSTITUTE, MOSCOW.

UNCLASSIFIED

USSR

UDC 621.315.592

G  
GERSHENZON, Ye. M. and MARTSINKELVICH, V. N.

"Using a Bimodal Resonator to Determine the Mobility and Concentration of Carriers in Semiconductors at Ultrahigh Frequencies"

Fizika, i Tekhnika Poluprovonikov, Vol. 4, No. 3, March 1970, pp. 542-548

Abstract: Most of this article is devoted to a derivation of various mathematical formulas for determining mobility and concentration as a function of observed parameters in the bimodal resonator. The fundamental equation from which the authors begin is taken from an article by N. Watanab in the Journal of the Physical Society of Japan, Vol. 16, No. 10, 1961. It expresses the square root of the ratio of input and output power in the bimodal resonator as a function of the external and natural Q factors of the resonator, the electrical fields in the sample and resonator, the volumes of the sample and resonator, the tensor or sample conductivity, the concentration of free carriers, the electron charge, the effective mass and the electromagnetic field frequency and impulse relaxation time.

From the initial formula, it is evident that the result is determined by 2 factors: rotation of the plane of polarization of the waves, caused

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GERSHENEON, Ye. M., et al, Fizika i Tekhnika Poluprovonikov, Vol. 4, No. 3, March 1970, pp. 542-548

by varying speeds of propagation of the two circular waves making up the plane polarized wave; elliptic polarization, connected with variations in the absorption of the circular waves. The former causes active unbalance of the resonator and the latter causes reactive unbalance. The relationships of the two types of unbalance depend on the factor equal to the frequency of the electromagnetic field multiplied by the impulse relaxation time. On the basis of these considerations, the authors develop a general formula for the square root of the ratio of output power to input power; however it is too complex for practical use. They then discuss possible simplifications in 4 special cases:

- 1) The product of Hall mobility and magnetic field induction is much less than 1.
- 2) The product of Hall mobility and magnetic field induction is much greater than 1, the electromagnetic field frequency multiplied by relaxation time is much less than 1.
- 3) Both these factors are much greater than 1.
- 4) The Hall relaxation time multiplied by the magnetic field induction is much greater than the product of field frequency and relaxation time, which is itself greater than 1.

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GERSHENZON, Ye. M., et al, Fizika i Tekhnika Poluprovodnikov, Vol. 4, No. 3, March 1970, pp. 542-548

In each case they derive simplified formulas for computing the mobility.

In determining concentration the primary source of difficulty is the requirement that the electrical field within the sample be known; only for very thin samples that cannot be calculated. The authors recommend additional measurements to eliminate the necessity for using the space factor in calculating concentration, thus eliminating the necessity for determining the electrical field inside the sample. They give a formula for determining the relative shift in resonator frequency, assuming small resonator perturbations due to a highly resistant nonmagnetic sample. They also consider some important special cases in which concentration can be determined, if it is assumed that free carriers make only a small contribution to dielectric permeability. These three cases are again determined by the values of the constants mentioned before:

1) The product of frequency and relaxation time is less than 1, the product of mobility and induction is much less than 1.

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GERSHENZON, Ye. M., et al, Fizika i Tekhnika Poluprovodnikov, No. 3, Vol. 4, March 1970, pp. 542-548

2) Both factors are greater than 1.

3) The product of frequency and relaxation time is much less than 1; the product of mobility and induction is much greater than 1.

Experiments were also performed using electromagnetic waves in the 8 mm band. The article includes a block diagram of the apparatus used and a summary of the results, indicating fairly good agreement with the theoretical predictions. The authors conclude that a bimodal resonator can be used in a broad class of problems involving the determination of semiconductor material parameters.

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1/2 033 UNCLASSIFIED PROCESSING DATE--23OCT70  
TITLE--DETERMINATION OF THE MOBILITY AND CONCENTRATION OF CARRIERS IN  
SEMICONDUCTORS AT ULTRAHIGH FREQUENCY USING A BIMODAL RESONATOR -U-  
AUTHOR-(02)-GERSHENZON, YE.M., MARTSINKEVICH, V.N.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TEKH. POLUPROV. 1970, 4(3), 542-8

DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--CRYOGENIC PROPERTY, GERMANIUM SEMICONDUCTOR, ALTERNATING  
MAGNETIC FIELD, ELECTRON MOBILITY, RESONATOR, CARRIER DENSITY, ULTRAHIGH  
FREQUENCY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FKAME--1988/0098

STEP NO--UR/0449/70/004/003/0542/0548

CIRC ACCESSION NO--AP0105184

UNCLASSIFIED



2/2 033

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0105184

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE POSSIBILITY OF USING A BIMODAL RESONATOR FOR MEASUREMENT OF THE MOBILITY ( $\mu$ ) AND CONC. ( $N$ ) OF CARRIERS IN SEMICONDUCTORS AT ULTRAHIGH FREQUENCIES (8-MM BAND) EVEN AT LIQ. HE TEMP. AND STRONG MAGNETIC FIELDS ( $\mu B$  GREATER THAN 1) IS DISCUSSED. SIMPLIFIED EXPRESSIONS ARE GIVEN FOR EVALUATING  $\mu$  UNDER THE CONDITIONS: ( $V_{SUBC}$  IS SMALLER THAN 1,  $V_A$  ARBITRARY); ( $V$  IS SMALLER THAN 1,  $V_{SUBC}$  IS GREATER THAN 1); ( $V$  IS GREATER THAN 1,  $V_{SUBC}$  IS GREATER THAN 1); AND ( $V_{SUBC}$  IS GREATER THAN 1,  $V$  IS GREATER THAN 1), AS WELL AS FOR  $N$  AT ( $V$  IS SMALLER THAN 1,  $V_{SUBC}$  IS SMALLER THAN 1); ( $V$  IS GREATER THAN 1,  $V_{SUBC}$  IS GREATER THAN 1); AND  $V$  IS SMALLER THAN 1,  $V_{SUBC}$  IS GREATER THAN 1); HERE  $V_{SUBC}$  EQUALS  $E \tau \hbar \omega$ ,  $\mu B$  EQUALS  $\mu B$ ,  $V$  EQUALS  $\omega \tau$ ;  $\omega$  IS THE FREQUENCY OF THE ELECTROMAGNETIC FIELD AND  $\tau$  IS THE MOMENTUM RELAXATION TIME. THESE EXPRESSIONS ARE CONSISTENT WITH EXPTL. RESULTS OBTAINED WITH  $N_{Ge}$  AT 8-20 DEGREES K. FACILITY: MOSK. GDS. PEDAGOG. INST. IM. LENINA, MOSCOW, USSR.

UNCLASSIFIED

UDC 536.46

USSR

VEDENEYEV, V. I., GERSHENZON, YU. M., SARKISOV, O. M., Moscow

"Upper Limit of Spontaneous Combustion of Hydrogen with Oxygen"

Novosibirsk, Fizika goreniya i vzryva, Vol 8, No 3, 1972, pp 403-408

Abstract: A study was made of the basic experimental laws with respect to the upper limit of spontaneous combustion beginning with the mechanism including only the reaction of O and H atoms and the OH, HO<sub>2</sub> radicals. The chemical formulas and mathematical descriptions are presented for these reactions. A study is then made of the combustion limit for vessels with an active surface, for example, KCl. The proposed kinetic system both qualitatively and quantitatively describes the existing experimental data with respect to the second limit of combustion of hydrogen with oxygen as demonstrated by the fact that the values of the constants of the elementary stages do not contradict the published data. A brief survey of experimental facts and data is presented in support of the developed laws.

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Combustion

USSR

UDC 541.126.2:546.16:546.11.022

BULATOV, V. P., VEDENEYEV, V. I., GRESHENZON, YU. M., DEKENT'YEV, A. P., and SARKISOV, O. M., Institute of Chemical Physics, Academy of Sciences USSR

"The Non-Linear Mechanism of Spontaneous Combustion in the Reaction Between Fluorine and Deuterium"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 3, 1972, pp 557-559

Abstract: Previously it had been determined from the isothermal spontaneous combustion of phosphorus in fluorine that the vibrationally-excited deuterium molecules bring about branching in this reaction. In this study, the influence of the external initiation of active centers in the limit of the spontaneous combustion reaction between fluorine and deuterium is determined. The reaction mixture was composed of  $O_2:D_2:F_2$  in the ratio of 5.5:1:1 at a pressure of 1 torr. A plot of the rate of radical accumulation as a function of temperature shows an abrupt change at  $T = 590^\circ K$ . Increasing in reaction time 2.7-fold did not significantly change the disruption temperature. The value of  $T$  decreased with increasing partial pressure of fluorine at a constant total pressure, and also with an increase in the total pressure, and increased on addition of small amounts of  $CO_2$ . Previously it had been shown that the

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USSR

BULATOV, V. P., et al., Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 3, 1972, pp 557-559

contributions of the nonlinear phases are essentially related to the experimental conditions determining the competition of the rates of branching according to the following paths -- (1)  $D_2(v = 1) + F_2 = D + DF + F$ ; and (2)  $D_2(v > 1) + F_2 = D + DF + F$  -- by the ratio of the constants  $k_2/k_1 \propto \exp 9000/RT$  and that of  $[D_2](v > 1)/[D_2](v = 1)$ . It was concluded that the lower limit of spontaneous combustion  $F_2 + D_2$  is related to the rate of production of active centers. The expansion of the region in which this reaction occurs on external initiation confirms the nonlinear mechanism of branching presented above.

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- 3 -

Reaction Kinetics

USSR

UDC 541.126+542.943

VEDENEYEV, V. I., GERSHENZOU, Yu. M., and SARKISOV, O. M., Institute of Chemical Physics of the Academy of Sciences of the USSR

"Chain Reaction and the Liberation of Heat Near the Lower Limit of Self Ignition of an Oxygen-Hydrogen Mixture"

Moscow, Doklady Akademii Nauk SSSR, Vol 208, No 1, 1973, pp 116-119

Abstract: The purpose of this work was to establish the effect of various nonlinear processes on the behavior of the oxygen-hydrogen reaction near the lower self ignition limit. It is found that although the experimentally defined self ignition limits in the kinetic and diffusion regions of the reaction chain termination are described by the same condition,  $\varphi=0$ , the reaction kinetics in the two regions differ significantly in principle. The difference between the self ignition limit and the limit of slow reaction manifests itself in that near the self ignition limit increase of temperature of the gas mixture can change significantly the reaction kinetics.

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Thin Films

USSR

UDC: 669.71:539.217.3

GERSHINSKIY, A. YE., Institute of Mathematics, Siberian Branch of the Academy of Sciences USSR.

"Distribution and Diffusion Coefficient of Titanium Atoms in Aluminum Films"

Sverdlovsk, Fizika metallov i metallovedeniye, Vol 32, No 5, Nov 71, pp 1104-1107

Abstract: Discussed in an earlier study (1970) by this author was an electrometric method of determining diffusion coefficients in thin metal films on the basis of the difference in the amount of electricity between the current-time characteristics prior to and after isothermal diffusion annealing of a two-layer thin-film structure. It appears that this method of determining diffusion parameters is applicable only to metals which, as a result of diffusion, form solid interstitial solutions. This study makes use of current-time characteristics of the oxidation of a solid solution, formed as a result of diffusion in a two-layer thin-film structure, to determine the atom distribution of one layer from the

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USSR

GERSHINSKIY, A. YE., Fizika metallov i metallovedeniye, Vol 32, No 5,  
Nov 71, pp 1104-1107

thickness of the second layer. This modification of the method permits study of diffusion processes in thin metal films regardless of the type of solid solution. The distribution of the relative concentration of titanium atoms over the thickness of an aluminum film following diffusion annealing at 400°C is reflected in a curve. The procedure of determining atom concentrations from a family of curves of both homogeneous and inhomogeneous solid solutions is detailed and mathematical expressions for determining the atom diffusion coefficient are derived. (2 illustrations, 4 bibliographic references).

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Thin Films

USSR

UDC 548.526

GERSHINSKIY, A. Ye., and KOSTSOV, E. G., Institute of Mathematics, Siberian Department of the Academy of Sciences USSR

"Electrometric Method of Determining Diffusion Coefficients of Impurities in Thin Metallic Films"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 30, No 6, Dec 70, pp 1315-1317

Abstract: A method was proposed for investigating diffusion processes in thin films, based on measuring the amount of electricity consumed in the process of anodic oxidation of films. The diffusion anneal of two contacting layers leads to a change in the kinetics of the anode process and the amount of electricity  $Q_c$  consumed in specified time intervals, as a result of which atoms of the counter substance are introduced into each of the layers. The total magnitude of  $Q$ , necessary for anodic oxidation of both layers, is held constant in this case. A similar method, distinguished by high sensitivity, is used in determining the nature and small amount of reaction products (up to  $10 \text{ \AA}$ ) formed on the metal surface.

Samples were made in the course of a single vacuum cycle at a pressure of  $1/2$



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GERSHINSKIY, A. Ye., and KOSTSOV, E. G., Fizika Metallov i Metallovedeniye, Vol 30, No 6, Dec 70, pp 1315-1317

$5 \times 10^{-8}$  mm Hg and the upper layer of aluminum with a thickness of  $250 \text{ \AA}$  was deposited on a titanium film with the substrate at room temperature. After this the samples were annealed at  $690^\circ \text{ K}$  (in a vacuum) for 20 minutes. From the results of measuring seven samples with aluminum films having a thickness of  $225\text{--}250 \text{ \AA}$ , the diffusion coefficient for titanium in aluminum was determined and found to be  $2.9 \pm 2 \times 10^{-18} \text{ cm}^2/\text{sec}$  at  $690^\circ \text{ K}$ . After a diffusion anneal at  $650$  and  $740^\circ \text{ C}$  the diffusion activation energy and pre-exponential member were found to be, respectively,  $1.74 \pm 0.05 \text{ eV}$  and  $1.9 \times 10^{-5} \text{ cm}^2/\text{sec}$ . The diffusion coefficient can be roughly determined from the formula  $Q = \alpha d_{\text{ef}} = \alpha \sqrt{Dt}$ , where  $d_{\text{ef}}$  is the effective thickness of the diffused substance,  $\alpha$  is the coefficient of proportionality determined from Faraday's law, and  $t$  is the diffusion anneal time.

The described method makes it possible to determine the diffusion coefficient in films with a thickness of  $30\text{--}50 \text{ \AA}$  and larger and to span the range of measuring  $D$  in the limits of  $10^{-13}\text{--}10^{-20} \text{ cm}^2/\text{sec}$ .

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GERSHMAN, B. I.

GUIDE TO BUILDING COMMUNICATION CABLE INSTALLATIONS

Communications Cables

Excerpts from a book by D. A. Baron, B. I. Gershman, A. I. Grodnev, S. I. Aizel, G. Sh. Mitznerlik, and L. D. Nazimov, Postoye, Stroychnik Stroytel'ya Kabel'nykh Sooruzheniy Svyazi, Russkaya, Izdatel'stvo Svyazi, 1968, pp. 105-108.

3.4. Main-Line High-Frequency Symmetrical Cables

Types of Cables

For main-line communications, the following types of cables are used: MKS, with cordel-styroflex insulation in a lead casing; MKSA, with cordel-styroflex insulation in an aluminum casing; and MK, with cordel-paper insulation in a lead casing.

These cables are fabricated in a spiral quid, and the diameter of the wires is 1.2 mm, the capacitance 1x4, 4x4 and 7x4.

MKS Cables with Cordel-Styroflex Insulation in a Lead Casing (GOST (All-Union State Standard) 9046-59)

Main-line MKS cables with cordel-styroflex insulation are intended for main cable lines, multiplexed with K-60 high-frequency apparatus in the spectrum of frequencies up to 252 kilohertz with a remote power supply of up to 750 volts direct current and KKR multiplexing, in the spectrum up to 552 kilohertz. The cables are produced with 1.4 or 7 high-frequency quads. Aside from this, 4x4 cables may have five signal wires, and 7x4 cables 6 signal wires. The diameter of the copper current-conducting wires of the high-frequency quads is 1.2 mm, and that of the signal wires 0.9 mm. Depending upon the type of protective covers, the cables are marked as follows: MKSG, in a lead casing, bare; MKSB, armored with steel ribbons; MKSHV, armored with steel ribbons; lead casing protected by a polyvinyl chloride hose or ribbons; MKSK, armored with round wires; MKSKV, armored with round wires, lead casing protected by polyvinyl chloride hose or ribbons.

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Caral

USSR

UDC: 532.137

GERSHKOVICH, B. M.

"New Capillary Express Viscosimeters"

. Moscow, Izmeritel'naya tekhnika, No. 11, 1970, pp 48-49

Abstract: Because of defects in the standard viscosimeter -- in the conical funnel Vz-1 or Vz-4 types, for example -- the Special Design Office of the All-Union Scientific Research Institute for New Building Materials has constructed and tested two capillary express viscosimeters based on the measurement of the time for leakage of a fixed volume of the test fluid through a capillary inside the viscosimeter chamber under the action of hydrostatic pressure. This instrument, given the nomenclature of VzV-3, is shown in a cross-sectional diagram in which each part is labeled. The advantage it offers over the standard type of instrument is that measurements for various types of fluid can be made without withdrawing the probes from the instrument chamber. The construction and operation of this instrument together with the viscosimetric tube VzT-1, a device for measuring small volumes of fluid in a graduate of 250 or 100 milliliters, are described.  
1/1

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UR 0482

Soviet Inventions Illustrated, Section II Electrical, Derwent, 1/70

241795 ROTATING VISCOSIMETER consists of two cylinders.

one inside the other. The inside cylinder 1 placed on bearing 2 is fitted with a recorder of the angle of rotation 3. The outside cylinder consists of two tumblers 4 and 5 with perforated walls 6. The tumbler 4 is fixed on to the working container 7 containing the liquid and driven by mechanism 9. Tumbler 5 has a mechanism 10 for turning it at a prearranged angle relative to tumbler 4.

The tested liquid 8 is poured into container 7 just when the through holes 6 are coaxial. The liquid passes through the holes into the clearance between the inside cylinder 1 and tumbler 5. The tumbler is then turned so that the through holes in the walls are facing tumbler 4.

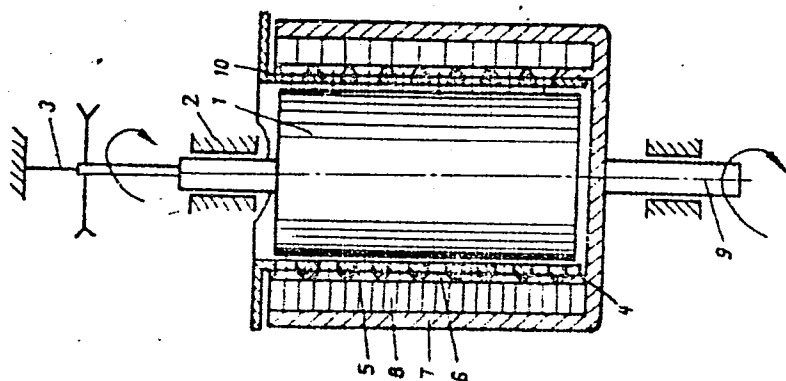
After that drive 9 transmits to container 7 a rotational torque to the inner cylinder 1 and through it to recorder 3 of angle of turning.

The registered angle serves as measure of viscosity of the liquid.

15.4.68 as 1233000/26-25. B. M. GERSHKOVICH. NEW CONSTRUCTION MATERIALS SPECIAL DES. OFFICE & RES. (18.4.68) Bul 14/18.4.68. Class 421. Int.Cl.G01n.

19781419

AA0046279



Spetsial'noye Konstruktorskoye Byuro  
Vsesoyuznogo Nauchno - Issledovatel'skogo Instituta  
Novykh Stroitel'nykh Materialov

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AA0040774

GERSHKOVICH

B.M.  
UR 0482

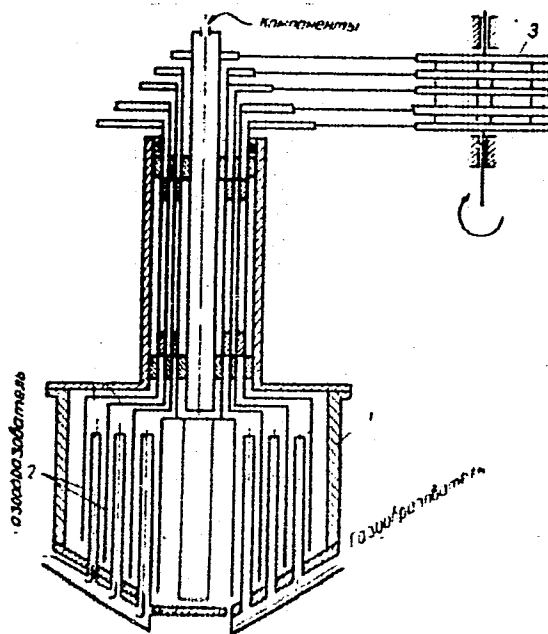
Soviet Inventions Illustrated, Section I Chemical, Derwent, 1-70

242369 POLYSTYRENE BEADS PRODUCTION, in a mixer the schematic arrangement of which is shown in the diagram; the cylindrical container (1) is equipped with concentrically distributed blades (2), with the drive mechanism (3), which ensures that the differently located blades are all driven at the same linear rate of motion by the system of belt-and-pulley arrangements. There are also perforated diffusers located between the blades, through which the gas required to assist in the production of the necessary composition for the preparation of the final product is admitted. The mixer ensures that high intensity and uniformity of mixing is obtained across the entire cross-section of the mixing chamber, thus increasing productivity and the quality of the material produced.

11.8.65. as 1022289/23-5, AGADZHIDANOV, G.S. and others. (2.9.69) Bul. 15/25.4.69. Class 39a<sup>5</sup> Int Cl. B 29g. |

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AA0040774

AUTHORS: Agadzhanov, G. S.; Morgulis, M. L.; and Gershkovich, B. M.

19750474



Aluminum and Its Alloys

USSR

UDC 669.71

DOBROMYSLOV, A. V., BUYNOV, N. N., GERSHKOVICH, R. M., and GLEBOV, V. V.,  
Institute of Physics of Metals of the Academy of Sciences USSR

"Investigation of the Structure of Guinier-Preston Zones in the Alloy  
Aluminum-Silver"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 31, No 5, May 71, pp  
1058-1062

Abstract: A comparative roentgenographic and electron-microscopic investigation of sizes of Guinier-Preston (G-P) zones was carried out with a view to examine the correctness of the three-phase model of the decay in aluminum-silver alloy. The investigation included the determination of the silver distribution in the G-P zone with full account for the diffusion dispersion. With that end in view, coefficients of order in the alloy aluminum-silver, water quenched from 535°C with subsequent aging at 165°C over a period of 15 min, were determined. A method is discussed by which the silver concentration in the G-P zone, which was found to be equal to the amount of silver previously present in a specific volume of the alloy, can be determined. Five illustr., five formulas, nine biblio. refs.  
1/1

UDC 669.715'782:620.186

USSR

KUZNETSOV, G. M., ROTENBERG, V. A., GERSHMAN, G. B., KHRUSHCHOVA, K. M., and ZIL'BERG, Yu. Ya., State Union Scientific Research Tractor Institute; Moscow Institute of Steel and Alloys

"Methods and Theories of the Modification of Hypereutectic Silumins"

V sb. Modifitsir. siluminov (Modification of Silumins -- Collection of Works), Kiev, 1970, pp 5-19 (from RZh-Metallurgiya, No 12, Dec 70, Abstract No 12 1746 by I. NABATOVA)

Translation: The authors consider in detail substances creating the effect of modification of hypereutectic Silumins and methods of introducing them. Modifiers of primary Si are P, copper phosphide (eutectic), reaction mixtures "alphosite," "phoral," a mixture of 52%  $\text{Li}_3\text{PO}_4$  + 40% Al + 8% P, a mixture of  $\text{Al}_3\text{PO}_4$  +  $\text{Mg}_2\text{P}_2\text{O}_7$  + ethane  $\text{C}_2\text{Cl}_6$  + copper phosphide, polytetrafluoroethylene + P + AlP; Be, Cu, Ag, Zn, Cd, Hg, Se, Te, Ca, Cd, Ge, Ti, S, P, and Na, as well as a mixture of eutectic Silumin with Al shavings in combination with Na, break up the Si and the eutectic simultaneously. The following hypothesis explaining the modification mechanism are discussed: 1) formation of nuclei of the AlP type; 2) connection with Al-Si-modifying-element phase diagrams;

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KUZNETSOV, G. M., et al., V sb. Modifitsir. siluminov (Modification of Silumins -- Collection of Works), Kiev, 1970, pp 5-19 (from RZh-Metallurgiya, No 12, Dec 70, Abstract No 12 1746 by I. NABATOVA)

3) limitation of the growth of Si crystals. The last hypothesis gives a fuller explanation of the experimental data. Two tables. Bibliography of 59 titles.

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"Intercentral Relations in the Human Cerebral Cortex According to Data From  
Coherence and EEG Phasic Spectra"

Moscow, Zhurnal Vysshey Nervnoy Deyatel'nosti imeni I. P. Pavlov, Vol 23,  
Vyp 4, Jul/Aug 73, pp 771-781

Abstract: The EEG of the occipital, parietal, central, frontal and temporal  
cortical areas were studied in 36 healthy subjects. The energetic and  
reciprocal spectra were produced with a computer and used to determine the  
expression of each rhythm. The degree of their interaction was calculated  
by analyzing the coherence and phasic spectra. Using this method statistical  
and temporal correlations may be found independent of energetic character-  
istics. A complex structure of relationships between rhythms was found,  
with differing degrees of connection and temporal relations at discrete  
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GRINDEL', O. M., et al., Zhurnal Vysshey Nervnoy Deyatel'nosti imeni  
I. P. Pavlov, Vol 23, Vyp 4, Jul/Aug 73, pp 771-781

frequencies of even one physiological range of rhythms. The values of coherence and phasic shifts of symmetrical points were quite similar in subjects with or without alpha predominance. Different forms of coherence of the central non-specific cortical zone with the anterior and posterior regions were seen within one hemisphere. Under the influence of afferent stimuli the intercentral relations were found to change in various ways, depending in part on the type of stimulus.

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